MANITOBA ECONOMIC

MULTIPLIERS

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Manitoba

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PREFACE

This publication presents economic multipliers and intensity ratios for Labour Income, Gross Domestic Product (at factor cost), and Employment for the Manitoba economy. All tables and results have been derived from the Statistics Canada 1979 inter-provincial input-output model. The tables presented here are at the medium level of aggregation (43 industries and 92 commodities) and include only data for Manitoba. The Manitoba Bureau of Statistics has available more detailed information, and subject to availability and confidentiality requirements, will provide it to interested users. In addition, where cases warrant, the Bureau can arrange for specific simulations to be run using the 1979 model.

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I. EXECUTIVE SUMMARY

The multipliers presented in this publication show the direct, indirect and induced effects of a change in economic production on the Province of Manitoba. In addition, three different ways of measuring the impact of economic change are presented, namely the impact on Labour Income, Gross Domestic Product, and Employment.

Table One is in the form of intensity ratios and measures the total in-province impact per dollar of purchase for 92 different commodities. To use this table to estimate impacts for labour income or gross domestic product, the value of change in purchase is multiplied by the relevant commodity intensity ratio. To determine employment impacts, the value of change in purchase is divided by $10,000 and multiplied by the intensity ratio scaled in either 1979 or 1984 dollars.

Table Two is analogous to Table One, except that it is from the persepctive of industry (43 groups) and the province of production rather than commodity and province of purchase.

Table Tnree consists of the traditional multipliers for 40 industries. To use these multipliers, for any given change in output, it must be possible to calculate the contribution to direct GDP and labour income and be given the number of direct jobs. The value of direct GDP, labour income and number of direct jobs is multiplied by the relevant industry multiplier to determine the impact.

A schematic summary for use of the three tables is presented on the following page.

Users of multipliers should be cautioned, that because of certain methodological limitations, they are best used for comparative rather than absolute analysis.

SUMMARY OF USE OF MULTIPLIERS

INFORMATION REQUIRED

(1) Dollar value of a change in purchase of a commodity in Manitoba. → Use Table One → Locate commodity and multiply dollar value of change in purchase X relevant intensity ratio.

(2) Dollar Value of a change in output of an industry.

- Have just dollar value of change in output. → Use Table Two → Locate industry and multiply dollar value of change in output X relevant intensity ratio.
- Have sufficient detailed cost information to calculate direct GDP, Labour Income and Direct Employment. → Use Table Three → Locate industry and multiply calculated direct components X relevant multiplier.

II. INTRODUCTION

The estimate of Gross Domestic Product (GDP) found in the Manitoba Provincial Economic Accounts provides a measure of unduplicated economic production for the province. It is "unduplicated" because it measures only the value of final transactions - all inter-business purchases and sales associated with intermediate production are cancelled out. For example, if Industry A purchases a good from Industry B, to be used as an input in its production process, the transaction is not directly recorded in GDP. The value of the good purchased from Industry B is implicitly counted in the value of output of Industry A. If we were to count it at this intermediate stage of production (i.e., when it is used as an input into another industry) and count it again when the industry which purchased it sells it into final demand (i.e., when it is sold to households for consumption, to business for investment purposes, or is exported) we would be double counting its value.

A necessary by-product of the measurement of GDP is that the record of all these intermediate transactions is lost and extremely useful information concerning the linkages between industries is not revealed. Input-output accounts constitute an attempt to bring back into record these inter-industry flows of goods and services.

The most used components of the input-output accounts are the economic multipliers. The concept of a multiplier is a fairly simple one to understand. For example, when there is an increased demand for a commodity it has three effects. It impacts first on those firms which expand production to satisfy that demand. These are termed the "direct" effects. Secondly, there is a ripple effect as these firms must obtain more inputs which are provided by other industries. These are termed the "indirect" effects. Lastly, as all firms expand production they hire more staff and pay out more wages which increases the income received by households. The households spend most of this extra income which, in turn, increases the demand for other commodities starting the entire process again. These are termed the "induced" effects. When all three effects (direct, indirect and induced) are taken together they are referred to as the total effects.

Multipliers are calculated by taking the total change and dividing it by the direct change. Two main kinds of multipliers can be derived. The first are called "simple" multipliers and reflect only the direct and indirect effects. The second are called "total" multipliers and reflect not only the direct and indirect effects but the induced effects as well. Since most users are interested in the total effects only, these multipliers are included in this publication.

III. USES AND LIMITATIONS OF MULTIPLIERS

While economic multipliers can be a useful component in the decision making process, users should be aware of their limitations. Some of the most significant ones are that the provincial input-output model is static, not subject to the limits of production capacity, and is based on average patterns for technology and costs for commodities and industries. For these and other reasons the input-output model cannot provide a complete or absolute measure of the impact of economic change. For example, if there is an increase in demand for a commodity, the model assumes that (1) production can be met without a change in capacity (i.e., construction of new plants); (2) Manitoba industries will maintain their fixed share of the market, and the rest (if any) will be imported from the rest of Canada or outside the country, and (3) that the increase in output will be accomplished at the industry average costs of production using 1979 technology. It is unlikely that in the real world any of these assumptions would hold. In all probability, there would be a change in the market share and depending on the level of capacity, the marginal costs of an increase in output would be greater or lower than the average costs. In addition, there have been significant changes in technology in many industries since 1979.

In spite of these limitations, economic multipliers can be extremely useful especially when they are used for comparative rather than absolute purposes. The most common use for multipliers is in estimating the economic impact of the establishment of a new firm, or the expansion, contraction or closure of existing firms. As mentioned above, it is preferable to use multipliers to determine which of two or more activities has the greatest impact rather

than using the multipliers to determine the absolute impact of a single event. If the multipliers are used to analyze a single event, the user should be cautioned that the results should be treated as general estimates only and not absolutes.

IV. DESCRIPTION OF TYPES OF MULTIPLIERS

Multipliers can be derived for either industries or commodities and expressed in absolute form or as intensity ratios. In addition, three different ways of measuring the impact of economic change are presented here, namely the impact on labour income, GDP (at factor cost) and employment. Below is a brief description of each of the three tables contained in this report and how they should be used.

TABLE 1

Table 1 is the total effects (direct, indirect and induced) of a dollar's purchase in Manitoba of each of the 92 commodities. The results are in the form of intensity ratios and measure the in-province effects in terms of labour income, GDP (at factor cost) and employment. Both labour income and GDP are expressed in terms of impact per dollar of purchase. For example, if demand increased in Manitoba in 1984 for alcoholic beverages (Commodity 24) such that an additional $30,000 was purchased, the effects would be as follows: Total labour income would increase 0.247 x $30,000 = $7,410, while GDP would increase by 0.430 x $30,000 = $12,900. Employment has to be treated slightly differently. The first column for employment is scaled in units of $10,000 in 1979 dollars. If a price index for alcoholic beverages is available, it can be used to "inflate" the 1979 dollars to 1984 dollars by putting $\frac{\$10,000 \times 1984 \text{ (index 1979=100.0)}}{100}$ and dividing $30,000 (1984 dollars) by the result, then multiplying by 0.159. Conversely, if the price index is not available, the column which expresses employment per $10,000 in 1984 dollars can be used (MBS has adjusted these ratios to reflect price changes from 1979 to 1984). In this case the result would be $\frac{\$30,000}{\$10,000} \times 0.089 = 0.267$ jobs.

TABLE 2

Table 2 is analogous to Table 1, except that it is from the perspective of industry (43 groups) and the province of production rather than commodity and province of purchase. For example, if there was an increase in output in the food and beverage industries (Industry 8) of $100,000, the effects would be as follows: labour income would increase 0.3755 x $100,000 = $37,550, while GDP would increase 0.7087 x $100,000 = $70,870. Employment, as in Table 1, has to be treated differently. If an industry selling price index for food and beverages is available, the process described under Table 1 would be repeated; $\frac{\$10,000 \times \text{1984 index (1979=100.0)}}{100}$ then dividing the result into $100,000 and multiplying by 0.2126. If a price index is not available, the ratio from the employment column scaled in units of $10,000 in 1984 dollars would be used. This would yield the result $\frac{\$100,000}{\$10,000} \times 0.1529 = 1.529$ jobs.

TABLE 3

Table 3 consists of the traditional multipliers (direct and indirect and induced effects over direct effects) for 40 industries. In order to use these multipliers, the direct GDP or labour content caused by a change in output must be calculated and the direct number of jobs created by the project must be given. The components which constitute direct GDP are items which make up a firm's operating surplus (wages, profits, interest, depreciation, etc.). It must be remembered that the change in output of a firm is not (in almost all cases) what constitutes its direct contribution to either labour income at GDP. This means that the multiplier is not simply applied to the change in output for an industry. To use the labour income multiplier, the amount of wages and supplementary labour income paid or lost as a result of a change in output must first be calculated, and then the multiplier applied to this value. In the case of GDP multiplier, the direct GDP content of a change in output is calculated and the multiplier is applied to this value. The employment multiplier is expressed in terms of total employment per direct job. For example, if a firm in the wood industries

(Industry 5) was established, that employed 20 people directly, it would create a total of 20 x 1.883 = 37.66 jobs (i.e., 20 direct plus an additional 17.66 indirect and induced jobs).

V. EXAMPLES OF HOW TO USE THE MULTIPLIERS

Below is an example of how to use the multipliers and intensity ratios. Which ones you choose and how you use them depends on what information you have at your disposal.

EXAMPLE

The task is to analyze which of two projects will have the larger economic benefit to the province. The following information is given:

(1) Project One

Construction of a plant to produce machinery. It will cost $5.0 million to build in 1984, and a further $3.0 million will be spent purchasing machinery and equipment. When in operation in 1985, it will employ 11 people and generate sales of $1,000,000 with the following distribution of costs.

$ 205,900	Wages
22,100	Interest
37,900	Profit
13,000	Depreciation
30,000	Overhead
691,100	Materials
$1,000,000	TOTAL

(2) Project Two

Expansion of output of an establishment in the metal mines classification of $1 million in 1984 and 1985.

ANALYSIS OF PROJECT ONE

To analyze the impact of Project One, it would be divided into two phases. The first phase would be that of construction of the plant and the purchase of the machinery and equipment, both of which would occur in 1984. The second phase would be the effect of the yearly output of the plant commencing in 1985.

CONSTRUCTION PHASE OF PROJECT ONE

To measure the impact of the construction phase, refer to Table 1 and look under Commodity 71, Non-Residential Construction. The commodity table is used because the construction would be done in Manitoba by contractors whose output or commodity is "construction" (in this case non-residential). In addition, there is a purchase of $3.0 million for machinery and equipment. If the kind of machinery is specified, it may be possible to match it directly with a listed commodity. If this is not possible, then the machinery and equipment listed at the end of the table (listed as Commodity 100) would be used.

The construction phase would have the following effects: labour income would grow by 0.543 x $5,000,000 = $2,715,000. GDP would increase 0.766 x $5,000,000 = $3,830,000. Employment would increase (using the column scaled in 1984 dollars) $\frac{\$5,000,000}{\$10,000}$ x 0.217 = 108.5 persons.

The impact of the purchase of machinery and equipment would be as follows: labour income would increase 0.083 x $3,000,000 = $249,000. GDP would increase 0.123 x $3,000,000 = $369,000. Employment would increase by $\frac{\$3,000,000}{\$10,000}$ x 0.043 = 12.9 persons.

It is obvious by their relative values, that Manitoba derives more benefit from construction activity than from purchases of machinery and equipment. This is because of the higher proportion of Manitoba content in construction (i.e., labour, more local materials) than in machinery and equipment which is generally produced outside the province.

OPERATIONS PHASE

The second impact of Project One is the actual operation of the plant which would take place in 1985. Since it is an industry that is being dealt with, the industry tables (Tables 2 and 3) would be used. As well, both the value of output and a breakdown of costs has been given, therefore either the industry intensity ratios (Table 2) or the industry multipliers (Table 3) can be used. To use Table 2, locate the industry (use the 1970 SIC manual if it is uncertain) and apply the ratios to the value of output. In this case, it is industry number 21, machinery industries.

Labour Income	0.3653 x $1,000,000 = $365,300
GDP	0.5646 x $1,000,000 = $564,600
Employment (1984 ratio)	$0.1862 \times \frac{\$1,000,000}{\$10,000} = 18.62$

Since detailed cost information has also be given, the industry multipliers given in Table 3 can be used. The first step is to analyze the cost categories and identify which ones do and do not enter into a firm's operating surplus, and hence directly into GDP. As a rule, wages, profit, interest, and depreciation are primary inputs (i.e., they are not purchased from another industry) and go directly into GDP. In this case it leaves two categories, overhead and materials, to be determined. If overhead consists of rent payments and salaries for administration which is the assumption in this case, it would also enter directly into GDP. Materials and other purchased inputs do not enter directly into GDP as they are purchased from other industries and will be reflected in the indirect effects. Therefore the following is the case.

$ 205,919	Wages	Direct GDP
22,100	Interest	Direct GDP
37,900	Profit	Direct GDP
13,000	Depreciation	Direct GDP
29,943	Overhead (rent)	Direct GDP
$ 308,862	Sub-Total Direct GDP	Direct GDP
691,138	Materials	Indirect GDP
$1,000,000	Total Costs	Gross Output

There is a total of $308,862 out of the $1,000,000 gross output that constitutes the firms direct contribution to GDP. There is also $205,919 of direct labour income and 11 direct jobs. To these values, the relevant multipliers for Industry 21 would be applied.

Labour Income	1.774 x $205,918 = $365,300
GDP	1.828 x $308,862 = $564,600
Employment	1.649 x 11 = 18.139

These results are identical to what was calculated using the intensity ratios. In actual practice the multipliers (Table 3) should be used, if possible, because the intensity ratios (Table 2) assume an "average" direct contribution to GDP for a given change in output for each industry. In practice, an industry could vary substantially from the average (for example, it could have a higher or lower labour content) and more accuracy can be obtained by calculating the firm's direct contribution to GDP than by relying on the averages implied in the intensity ratios.

ANALYSIS OF PROJECT TWO

In analyzing Project Two, the only information given is that it is an increase in output of $1 million in 1984 and 1985 for an establishment classified to the metal mines industry group. Since only industry data has been given, one of the industry tables (2 and 3) must be used. Since it is not possible to calculate the direct GDP content of the change in output (there is no breakdown of costs given) the industry intensity ratios on table number 2 must be used. On Table 2, metal mines is listed as industry number 4. The change in the value of output would be applied to each ratio.

Labour Income	0.4637 x $1,000,000 = $463,700
GDP	1.0145 x $1,000,000 = $1,014,500
Employment	$0.2429 \times \frac{\$1,000,000}{\$10,000} = 24.29$

Since the change in output of $1,000,000 is the same for both 1984 and 1985, the results would be the same for both years.

It is possible to allow for price increases in calculating employment beyond the year 1984. For example, if it is known that the industry selling prices for metal mines will increase in 1985 by five percent, the equation for determining employment (scaled in 1984 dollars) could be adjusted as follows.

Employment 1985 $\quad 0.2429 \times \frac{\$1,000,000}{(\$10,000 \times 1.05^{*})}$ $\quad$ *to reflect 5% increase in selling price

Employment 1985 $\quad 0.2429 \times \frac{\$1,000,000}{\$10,500} = 23.13$

The last step is to compare the results of the two projects. A summary of the results is as follows.

	1984	1985
Labour Income		
Project One	$2,964,000	$ 365,300
Project Two	$ 463,700	$ 463,700
GDP (at factor cost)		
Project One	$4,199,000	$ 564,600
Project Two	$1,014,500	$1,014,500
Employment		
Project One	121.4	18.6
Project Two	24.3	23.1

It can been seen quite clearly that Project One has the largest effect in 1984. The impact though, is entirely due to the construction of the plant. If a longer term outlook is taken, then Project Two will have the larger benefits. This is shown by comparing the benefits in 1985 where Project Two has greater impact than Project One in all three areas.

TABLE 1: MANITOBA COMMODITY INTENSITY RATIOS

	COMMODITY	TOTAL LABOUR INCOME PER DOLLAR PURCHASED	TOTAL GDP (FACTOR COST) PER DOLLAR PURCHASED	TOTAL EMPLOYMENT PER $10,000 PURCHASED IN 1979 DOLLARS	TOTAL EMPLOYMENT PER $10,000 PURCHASED IN 1984 DOLLARS
1	GRAINS	0.217	0.406	0.087	0.080
2	LIVE ANIMALS	0.368	0.689	0.144	0.129
3	OTHER AGRICULTURAL PRODUCTS	0.191	0.357	0.077	0.069
4	FORESTRY PRODUCTS	0.556	0.823	0.547	0.526
5	FISH LANDINGS	0.034	0.059	0.015	0.014
6	HUNTING & TRAPPING PRODUCTS	0.000	0.000	0.000	0.000
7	IRON ORES & CONCENTRATES	0.000	0.000	0.000	0.000
8	OTHER METAL ORES & CONCENTRATES	0.345	0.754	0.182	0.181
9	COAL	0.008	0.014	0.005	0.002
10	CRUDE MINERAL OILS	0.009	0.025	0.005	0.002
11	NATURAL GAS	0.004	0.007	0.003	0.001
12	NON-METALLIC MINERALS	0.221	0.416	0.126	0.080
13	SERVICES INCIDENTAL TO MINING	0.537	0.933	0.356	0.210
14	MEAT PRODUCTS	0.293	0.492	0.153	0.132
15	DAIRY PRODUCTS	0.362	0.600	0.199	0.125
16	FISH PRODUCTS	0.009	0.015	0.006	0.005
17	FRUITS & VEGETABLES PREPARATIONS	0.059	0.131	0.040	0.026
18	FEEDS	0.181	0.388	0.101	0.078
19	FLOUR,WHEAT,MEAL, & OTHER CEREAL	0.211	0.296	0.114	0.080
20	BREAKFAST CEREAL & OTHER BAKERY PROD	0.342	0.488	0.208	0.124
21	SUGAR	0.185	0.296	0.100	0.086
22	MISC. FOOD PRODUCTS	0.072	0.230	0.053	0.041
23	SOFT DRINKS	0.344	0.502	0.232	0.144
24	ALCOHOLIC BEVERAGES	0.247	0.430	0.159	0.089
25	TOBACCO PROCESSED UNMANUFACTURED	0.000	0.000	0.000	0.000
26	CIGARETTES & TOBACCO MFG.	0.011	0.018	0.006	0.004
27	TIRES & TUBES	0.006	0.010	0.003	0.002
28	OTHER RUBBER PRODUCTS	0.012	0.019	0.007	0.004
29	PLASTIC FABRICATED PRODUCTS	0.066	0.105	0.042	0.031
30	LEATHER & LEATHER PRODUCTS	0.042	0.065	0.033	0.027
31	YARNS & MAN MADE FIBRES	0.010	0.021	0.008	0.006
32	FABRICS	0.020	0.029	0.015	0.013
33	OTHER TEXTILE PRODUCTS	0.068	0.097	0.052	0.036
34	HOSIERY & KNITTED WEAR	0.020	0.031	0.015	0.011
35	CLOTHING & ACCESSORIES	0.090	0.135	0.077	0.055
36	LUMBER & TIMBER	0.107	0.178	0.090	0.090
37	VENEER & PLYWOOD	0.012	0.019	0.007	0.007
38	OTHER WOOD FABRICATED MATERIAL	0.220	0.343	0.174	0.126
39	FURNITURE & FIXTURES	0.181	0.274	0.132	0.085
40	PULP	0.011	0.019	0.007	0.005
41	NEWSPRINT & OTHER PAPER STOCK	0.099	0.181	0.067	0.045
42	PAPER PRODUCTS	0.127	0.203	0.079	0.067
43	PRINTING & PUBLISHING	0.402	0.518	0.252	0.166
44	ADVERTISING,PRINT MEDIA	0.725	0.935	0.459	0.302
45	IRON & STEEL PRODUCTS	0.081	0.145	0.051	0.037
46	ALUMINUM PRODUCTS	0.068	0.120	0.049	0.034

SOURCE: MANITOBA BUREAU OF STATISTICS
STATISTICS CANADA 1979 INTERPROVINCIAL INPUT-OUTPUT MODEL

TABLE 1 (CONT'D): MANITOBA COMMODITY INTENSITY RATIOS

COMMODITY	TOTAL LABOUR INCOME PER DOLLAR PURCHASED	TOTAL GDP (FACTOR COST) PER DOLLAR PURCHASED	TOTAL EMPLOYMENT PER $10,000 PURCHASED IN 1979 DOLLARS	TOTAL EMPLOYMENT PER $10,000 PURCHASED IN 1984 DOLLARS
47 COPPER & COPPER ALLOY PRODUCTS	0.047	0.087	0.028	0.029
48 NICKEL PRODUCTS	0.111	0.240	0.057	0.038
49 OTHER NON FERROUS METAL PROD	0.126	0.262	0.091	0.078
50 BOILERS, TANKS, & PLATES	0.125	0.202	0.093	0.075
51 FABRICATED STRUCTURAL METAL PROD	0.277	0.431	0.165	0.118
52 OTHER METAL FABRICATED PRODUCTS	0.101	0.154	0.065	0.047
53 AGRICULTURAL MACHINERY	0.015	0.024	0.011	0.007
54 OTHER INDUSTRIAL MACHINERY	0.046	0.066	0.031	0.021
55 MOTOR VEHICLES	0.011	0.016	0.008	0.006
56 MOTOR VEHICLE PARTS	0.048	0.068	0.031	0.022
57 OTHER TRANSPORT EQUIPMENT	0.080	0.136	0.054	0.038
58 APPLIANCES & RECEIVERS, HOUSEHOLD	0.009	0.013	0.005	0.004
59 OTHER ELECTRICAL PRODUCTS	0.048	0.077	0.033	0.023
60 CEMENT & CONCRETE PRODUCTS	0.382	0.770	0.238	0.163
61 OTHER NON-METALLIC MINERAL PROD	0.052	0.082	0.036	0.023
62 GASOLINE & FUEL OIL	0.042	0.018	0.025	0.011
63 OTHER PETROLEUM & COAL PRODUCTS	0.051	0.070	0.032	0.015
64 INDUSTRIAL CHEMICALS	0.044	0.085	0.028	0.018
65 FERTILIZERS	0.030	0.059	0.020	0.015
66 PHARMACEUTICALS	0.041	0.048	0.019	0.012
67 OTHER CHEMICAL PRODUCTS	0.045	0.082	0.028	0.018
68 SCIENTIFIC EQUIPMENT	0.074	0.092	0.052	0.034
69 OTHER MANUFACTURED PRODUCTS	0.068	0.090	0.047	0.033
70 RESIDENTIAL CONSTRUCTION	0.540	0.742	0.276	0.222
71 NON-RESIDENTIAL CONSTRUCTION	0.543	0.766	0.305	0.217
72 REPAIR CONSTRUCTION	0.544	0.715	0.347	0.247
73 PIPELINE TRANSPORTATION	0.052	0.493	0.051	0.034
74 TRANSPORTATION & STORAGE	0.301	0.403	0.154	0.102
75 RADIO & TELEVISION BROADCASTING	0.625	0.721	0.352	0.239
76 TELEPHONE & TELEGRAPH	0.513	1.072	0.400	0.272
77 POSTAL SERVICES	1.486	1.515	0.921	0.626
78 ELECTRIC POWER	0.292	1.142	0.228	0.187
79 OTHER UTILITIES	0.332	0.946	0.212	0.174
80 WHOLESALE MARGINS	0.357	0.531	0.227	0.149
81 RETAIL MARGINS	0.776	1.116	0.661	0.464
82 IMPUTED RENT OWNER OCPD. DWEL.	0.127	0.715	0.065	0.039
83 OTHER FINANCE,INS.,REAL ESTATE	0.204	0.374	0.138	0.096
84 BUSINESS SERVICES	0.251	0.365	0.182	0.134
85 EDUCATION SERVICES	1.340	1.257	0.695	0.429
86 HEALTH SERVICES	1.053	1.302	0.369	0.228
87 AMUSEMENT & RECREATION SERVICES	0.559	0.979	0.622	0.419
88 ACCOMODATION & FOOD SERVICES	0.678	0.982	0.613	0.412
89 OTHER PERSONAL & MISC. SERVICES	0.710	1.045	0.564	0.390
90 TRANSPORTATION MARGINS	0.084	0.124	0.047	0.031
91 OPERATING, OFFICE, LAB. & FOOD	0.327	0.470	0.243	0.167
92 TRAVEL, ADVERTISING & PROMOTION	0.478	0.647	0.330	0.222
100 MACHINERY & EQUIPMENT	0.083	0.123	0.058	0.043

SOURCE: MANITOBA BUREAU OF STATISTICS
STATISTICS CANADA 1979 INTERPROVINCIAL INPUT-OUTPUT MODEL

TABLE 2: MANITOBA INDUSTRY INTENSITY RATIOS

INDUSTRY	TOTAL LABOUR INCOME PER DOLLAR OF PRODUCTION	TOTAL GDP (FACTOR COST) PER DOLLAR OF PRODUCTION	TOTAL EMPLOYMENT PER $10,000 PRODUCTION IN 1979 DOLLARS	TOTAL EMPLOYMENT PER $10,000 PRODUCTION IN 1984 DOLLARS
1 AGRICULTURE	0.4383	0.8223	0.1708	0.1476
2 FORESTRY	0.6050	0.8849	0.6086	0.5262
3 FISHING, HUNTING, & TRAPPING	0.6123	1.0875	0.2156	0.2074
4 METAL MINES	0.4637	1.0145	0.2436	0.2429
5 MINERAL FUELS	0.1546	0.7209	0.0915	0.0338
6 NON-METAL MINES & QUARRIES	0.4289	0.9549	0.2634	0.1836
7 SERVICES INCIDENTAL TO MINING	0.5572	0.9176	0.4019	0.2372
8 FOOD & BEVERAGE INDUSTRIES	0.3755	0.7087	0.2126	0.1529
9 TOBACCO PRODUCTS INDUSTRIES	0.0000	0.0000	0.0000	0.0000
10 RUBBER & PLASTICS PRODUCTS IND	0.3750	0.6031	0.2443	0.1701
11 LEATHER INDUSTRIES	0.3577	0.5661	0.2917	0.2362
12 TEXTILE INDUSTRIES	0.3952	0.6388	0.3153	0.2286
13 KNITTING MILLS	0.3989	0.6125	0.2737	0.2095
14 CLOTHING INDUSTRIES	0.4726	0.7090	0.4177	0.3010
15 WOOD INDUSTRIES	0.5253	0.8208	0.4262	0.4270
16 FURNITURE, & FIXTURE INDUSTRIES	0.5367	0.8082	0.3963	0.2680
17 PAPER & ALLIED INDUSTRIES	0.3836	0.6910	0.2529	0.1783
18 PRINTING & PUBLISHING	0.7363	0.9481	0.4639	0.3221
19 PRIMARY METAL INDUSTRIES	0.3842	0.8059	0.2199	0.1747
20 METAL FABRICATING INDUSTRIES	0.4749	0.7268	0.2908	0.2083
21 MACHINERY INDUSTRIES	0.3653	0.5646	0.2687	0.1862
22 TRANSPORTATION EQUIPMENT IND	0.5388	0.7711	0.3978	0.2810
23 ELECTRICAL PRODUCTS INDUSTRIES	0.3913	0.6240	0.2679	0.1993
24 NON-METALLIC MINERAL PROD. IND	0.4184	0.8477	0.2706	0.1735
25 PETROLEUM & COAL PRODUCTS IND	0.0836	0.0321	0.0485	0.0222
26 CHEMICAL & CHEMICAL PROD. IND	0.3189	0.5480	0.1953	0.1273
27 MISC. MANUFACTURING INDUSTRIES	0.7543	0.9216	0.5568	0.3865
28 CONSTRUCTION INDUSTRY	0.5400	0.7495	0.3053	0.2102
29 TRANSPORTATION & STORAGE	0.6177	0.9499	0.3374	0.2234
30 COMMUNICATION	0.8086	1.2273	0.5436	0.3697
31 ELEC. POWER,GAS,OTHER UTILITIES	0.2940	1.1167	0.2243	0.1843
32 WHOLESALE TRADE	0.7555	1.1012	0.4774	0.3139
33 RETAIL TRADE	0.7793	1.1176	0.6641	0.4633
34 OWNER OCCUPIED DWELLINGS	0.1273	0.7152	0.0646	0.0391
35 OTHER FINANCE,INS., & REAL ESTATE	0.4916	0.9016	0.3331	0.2315
36 EDUCATION & HEALTH SERVICES	1.0733	1.2989	0.3925	0.2422
37 AMUSEMENT & RECREATION SERVICES	0.5474	0.9723	0.6206	0.4191
38 SERVICES TO BUSINESS MANAGEMENT	0.7387	1.0828	0.5757	0.4235
39 ACCOMODATION & FOOD SERVICES	0.6779	0.9791	0.6150	0.4128
40 OTHER PERSONAL & MISC. SERVICES	0.8206	1.0952	0.6144	0.4252
41 TRANSPORTATION MARGINS	0.1887	0.2783	0.1017	0.0673
42 OPERATING,OFFICE,LAB. & FOOD	0.3266	0.4701	0.2425	0.1666
43 TRAVEL & ADVERTISING,PROMOTION	0.4780	0.6469	0.3297	0.2217

SOURCE: MANITOBA BUREAU OF STATISTICS
STATISTICS CANADA 1979 INTERPROVINCIAL INPUT-OUTPUT MODEL

TABLE 3: MANITOBA INDUSTRY MULTIPLIERS

INDUSTRY	TOTAL LABOUR INCOME PER DOLLAR OF DIRECT LABOUR INCOME	TOTAL GDP (FACTOR COST) PER DOLLAR OF DIRECT GDP	TOTAL EMPLOYMENT PER DIRECT JOB
1 AGRICULTURE	1.711	1.620	3.144
2 FORESTRY	1.781	2.006	1.424
3 FISHING, HUNTING, & TRAPPING	1.458	1.415	2.371
4 METAL MINES	1.588	1.399	1.896
5 MINERAL FUELS	3.831	1.557	6.004
6 NON-METAL MINES & QUARRIES	1.636	1.644	1.772
7 SERVICES INCIDENTAL TO MINING	1.644	1.633	1.583
8 FOOD & BEVERAGE INDUSTRIES	2.989	2.674	2.509
9 TOBACCO PRODUCTS INDUSTRIES	0.000	0.000	0.000
10 RUBBER & PLASTICS PRODUCTS IND	1.671	1.705	1.715
11 LEATHER INDUSTRIES	1.962	2.020	1.609
12 TEXTILE INDUSTRIES	1.559	1.558	1.432
13 KNITTING MILLS	1.516	1.595	1.529
14 CLOTHING INDUSTRIES	1.552	1.611	1.382
15 WOOD INDUSTRIES	1.942	1.987	1.883
16 FURNITURE, & FIXTURE INDUSTRIES	1.592	1.683	1.521
17 PAPER & ALLIED INDUSTRIES	2.019	1.910	2.432
18 PRINTING & PUBLISHING	1.712	2.041	1.767
19 PRIMARY METAL INDUSTRIES	2.997	2.839	3.120
20 METAL FABRICATING INDUSTRIES	1.656	1.737	1.740
21 MACHINERY INDUSTRIES	1.774	1.828	1.649
22 TRANSPORTATION EQUIPMENT IND	1.575	1.725	1.491
23 ELECTRICAL PRODUCTS INDUSTRIES	1.658	1.722	1.657
24 NON-METALLIC MINERAL PROD. IND	1.843	1.754	1.916
25 PETROLEUM & COAL PRODUCTS IND	2.530	-0.424	3.451
26 CHEMICAL & CHEMICAL PROD. IND	2.007	2.139	2.317
27 MISC. MANUFACTURING INDUSTRIES	1.701	2.106	1.582
28 CONSTRUCTION INDUSTRY	1.713	1.940	1.945
29 TRANSPORTATION & STORAGE	1.660	1.733	1.939
30 COMMUNICATION	1.559	1.608	1.602
31 ELEC. POWER,GAS,OTHER UTILITIES	1.620	1.183	1.494
32 WHOLESALE TRADE	1.553	1.658	1.607
33 RETAIL TRADE	1.571	1.721	1.388
34 OWNER OCCUPIED DWELLINGS	4.748	1.234	
35 OTHER FINANCE,INS., & REAL ESTATE	1.782	1.616	1.790
36 EDUCATION & HEALTH SERVICES	1.453	1.727	2.340
37 AMUSEMENT & RECREATION SERVICES	1.974	1.803	1.513
38 SERVICES TO BUSINESS MANAGEMENT	1.566	1.665	1.464
39 ACCOMODATION & FOOD SERVICES	1.646	1.823	1.389
40 OTHER PERSONAL & MISC. SERVICES	1.465	1.644	1.395

SOURCE: MANITOBA BUREAU OF STATISTICS
STATISTICS CANADA 1979 INTERPROVINCIAL INPUT-OUTPUT MODEL